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U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ANIMAL INDUSTRY

INSTRUCTIONS FOR EMPLOYEES
ENGAGED IN ERADICATING
FOOT-AND-MOUTH
DISEASE



MARCH, 1925

Issued March, 1925

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ANIMAL INDUSTRY

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ENGAGED IN ERADICATING
FOOT-AND-MOUTH
DISEASE



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U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY.

Washington, D. C., March 23, 1925.

TO BUREAU EMPLOYEES:

The following information and instructions regarding methods to be followed in the eradication of foot-and-mouth disease are issued for the guidance of bureau employees and others engaged in that work. These instructions are supplemental to the various formal department orders and regulations relating to this subject.

JOHN R. MOHLER,
Chief of Bureau.

(II)

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INSTRUCTIONS FOR EMPLOYEES ENGAGED IN ERADICATING FOOT-AND-MOUTH DISEASE

INTRODUCTION

The following instructions are issued for the information and guidance of employees of the Bureau of Animal Industry and others who may at any time be engaged in the eradication of foot-and-mouth disease. These instructions are supplementary to and are not intended in any manner to supersede or conflict with any regulations which have been, or later may be, issued by the department.

Veterinary inspectors in all branches of the departmental service and also local practitioners should constantly be on the lookout for foot-and-mouth disease. Notwithstanding the fact that the department has taken every practicable precaution to eradicate outbreaks when they occur and to prevent the introduction of the disease into this country, the infection may recur or again be introduced from abroad. If in the examination of animals any condition may be found that arouses suspicion of foot-and-mouth disease, a careful inspection should be made along the lines herein outlined, and the chief of the bureau immediately informed of the situation by telegraph. In order to keep in mind the symptoms and lesions of the disease, veterinarians should read from time to time Farmers' Bulletin 666, as well as other standard veterinary works on foot-and-mouth disease.

INSPECTION

Parts to be examined.—Good light and restraint of the animals are essential in making careful inspections. All cattle, sheep, other ruminants, and swine suspected of being infected with foot-and-mouth disease, or where the slightest reason exists as to the possibility of their being so affected, should be carefully and systematically examined in order to determine whether such infection exists. This inspection should include the mouth, feet, teats, udders, and perineums of cows for the specific lesions of the disease, and the mouths and feet of sheep, other ruminants, and swine.

Lesions.—The specific lesion is the vesicular eruption in the form of vesicles or blisters with fluid contents, but next in order of importance in diagnosing the disease is the erosion showing abrupt borders which cause it to present a punched-out appearance. The most conspicuous chronic lesions are the rings on the hoofs and deformities of the feet. Temperatures of all animals in the herd should be recorded when it is practicable to do so.

Scope of inspection.—The examination should not be confined to the suspected animals, but should include all susceptible animals of different species on the farm, and if the suspicion of foot-and-mouth disease is strong, the inspection should extend to animals on adjacent farms. The number of animals affected and a description of the lesions should be noted. Special inquiry should be made into the history of the condition, and all information available should be considered with the view of ascertaining whether there is any evidence of contagion. The names and home addresses of employees, especially milkers,

should be recorded immediately when premises are quarantined. This will assist inspectors in finding them should they leave the infected premises.

When it is learned that owners of livestock or their help have visited infected premises within the last 10 days, their premises should be quarantined a sufficient period of time for any infection, which may have gained access, to develop visible symptoms.

Where range cattle are to be inspected a chute should be provided, if possible, to obviate the necessity of roping. An inspection made by riding among such cattle is not entirely reliable, but if no other means are provided the animals should be driven slowly past the inspector, single file. As range cattle show less fear of a man in an automobile than when he is on a horse, a visual inspection may be made at close range by using an automobile and placing it so that the cattle must pass between it and a fence. The inspector should observe cattle that are standing or lying down and note their movements immediately when they arise and start to walk or run. Suspicious cattle should be placed in a chute or roped and carefully examined.

Report to chief of bureau.—In all cases of foot-and-mouth disease, even where there are only slight grounds for suspicion of a new outbreak, the matter should be reported *immediately by wire* to the chief of the bureau and a detailed written report forwarded as soon as possible. This report should include a description of the lesions and their location, the number of susceptible animals of each species on the farm, the number of animals of each species affected, the temperature record, and the history, including the evidence, if any, of contagion. At the same time there should be forwarded to the department, in

tightly sealed containers, material immersed in a solution of equal parts of glycerin and boiled water for microscopic and inoculation purposes. This material should include the contents of vesicles when available, and, when not available, specimens from the freshest erosions or ulcers should be forwarded.

Inoculation of test animals.—In all suspicious instances when a positive diagnosis can not be made, veterinarians should proceed immediately, without waiting for a reply to their report, to make inoculation tests on hogs and calves. Calves should not be less than 1 year old. This may be done by rubbing some of the vesicular matter or specimens from lesions of suspected animals into scarified areas on the mucous membrane of the mouth and the skin between the toes, after cleaning with a dry, rough rag. Such inoculation also may be made by the use of a hypodermic syringe. On account of less satisfactory results, feeding tests with milk or other material from infected animals should be avoided. To eliminate the possibility that the affection may be vesicular stomatitis, two or three horses should be inoculated also.

Disinfection on leaving premises.—Care should be taken on leaving any suspected premises to disinfect the person and clothing in the manner described under the subheading "Procedure," on page 10.

PROCEDURE WHERE INFECTION IS FOUND

Cooperation with State authorities.—As soon as the diagnosis has been confirmed by the special representative of the department, the chief of the bureau will invite the proper State authorities to cooperate with the department in the arrest and eradication

of the disease, and a veterinary inspector will be designated to take charge of the work. The latter should promptly ask for the necessary help and cooperate with the State authorities in ascertaining the extent of the outbreak and in formulating State quarantine regulations. He should prevail upon the State authorities to quarantine the infected premises immediately and endeavor to make arrangements with them to place guards on each of the infected premises day and night to see that the quarantine is maintained.

Guards.—The inspector in charge shall specify the number of guards to be used, their duties, and their stations, and they shall work under his supervision.

Guards should be supplied with rubber outfits or other outer clothing that can be disinfected when they leave infected premises or are moved from one station to another. The most important duty of guards assigned to quarantined premises is to see that no person or animal leaves or enters the premises without proper authority. It is not permissible for a guard to disinfect persons and then allow them to leave infected premises. When it becomes imperative for an owner or any of his family or help to leave quarantined premises, application should be made to the inspector in charge, who will designate a competent assistant to do the disinfecting necessary. The inspector in charge should give each guard a letter specifying his duties in detail.

Quarantine.—The owners of affected herds should be fully instructed concerning the nature of the disease and the importance of maintaining a strict quarantine. In addition they should receive the letter of instructions prepared by the bureau. The owners of adjacent farms should also be notified and in-

structed in order that they may take precautions to protect their herds against infection. Any stockyards in the infected districts should be closed immediately and creameries and cheese factories investigated to see that skim milk, buttermilk, whey, and milk cans are being properly sterilized before being returned to farmers; otherwise the creameries and factories also should be closed. The moving of animals by motor trucks and other conveyances should receive attention.

Publicity.—Publicity of the outbreak should be given from the beginning through the distribution of posters, special circulars, and similar literature; also the daily papers, but such information should emanate from headquarters. Inspectors engaged in routine work should not give interviews. Public meetings of farmers and stockmen from the territory bordering the infected area should be called, when it is deemed advisable, to discuss foot-and-mouth disease and the methods to be employed in eradicating it, with particular reference to the duties of livestock owners and what will be expected of them. Stock owners from infected farms should not be permitted to attend these meetings and those from adjacent premises should be discouraged from attending in order to obviate the danger of spreading infection, as all necessary information regarding these matters will be carried to them by veterinary inspectors making farm-to-farm inspections. The veterinary inspector in charge of this work should see to it that representatives of the State authorities, members of livestock associations, and interested livestock owners of the community are requested to speak at these meetings.

Transportation of employees and equipment.—Arrangements should be made immediately for the transportation of employees and their equipment so that there will be no delay when the assistants arrive. Transportation should be obtained at as reasonable a rate as possible, consistent with prompt and efficient service. When the State or local agencies can not furnish the service, such means as are necessary should be procured from other sources. It should be explained to the person or firm furnishing transportation how settlement is made direct from Washington.

Tracing source of infection.—It is important that an investigation be made immediately to determine if possible the source of infection in order to prevent another outbreak from the same source. Veterinary inspectors should be detailed immediately to scout in the community wherever rumor or suspicion leads and to confer with local practitioners concerning their activities, in order that all infected herds may be found and quarantined as soon as possible. In addition to the scouts, other veterinary inspectors should be detailed to make a careful, systematic inspection of all livestock within a radius of 3 miles or more of the infected premises.

Tracing shipments.—A report should be obtained of all livestock shipments that were made from the community during a period beginning 10 days prior to the appearance of the disease and ending on the day the quarantine was established. All suspicious shipments should be traced to destinations and back to the farm where the stock originated in order to ascertain whether there was any probability that they were infected when shipped. These precautions should be taken as quickly as possible to limit the spread of the disease.

The veterinary inspectors at various public stockyards should be informed immediately by telephone or telegraph of any diseased, suspicious, or exposed animals that were shipped from the infected community to public stockyards. A record should be made of all railroad cars, motor trucks, and other conveyances that carried infected or exposed animals out of the infected district, and arrangements made with the various railroad companies and truck owners for the cleaning and disinfecting of such cars and trucks, under the supervision of an employee of the Bureau of Animal Industry, before they are again used.

Ordering supplies.—As soon as the diagnosis of foot-and-mouth disease has been confirmed, the veterinary inspector in charge should order by telegraph or telephone supplies enough to meet immediate needs. In order to save time the telephone or telegraph should be used in obtaining prices from different firms handling the needed supplies.

The usual supplies used in combating an outbreak of foot-and-mouth disease are suit cases, rubber goods, such as boots, coats, hats, gloves, also sponges, permanganate of potassium, formaldehyde, bichloride of mercury tablets, saponified cresol, chloride of lime, and pumps. For each pump there should be ordered 100 feet of 3-ply steam hose and attachments, two spraying nozzles, and an extra supply of leather valves. Implements, such as shovels, forks, hoes, scrapers, picks, crowbars, axes, etc., used in connection with the cleaning of the premises before disinfection must also be procured.

ORGANIZATION

Field headquarters.—Headquarters should be centrally located if possible. If the outbreak extends

over a large area the territory should be divided into districts, and a substation established in each district. A competent veterinary inspector should be detailed to take charge in each district. He should be furnished with the necessary assistants and equipment and should be held responsible for the efficient conduct of the work in his district.

When district substations are established, each substation should forward to the main office at the end of each week a roster giving the names and addresses of both Government and State employees and the number of additional men needed or any surplus that can be transferred.

Care of supplies.—From the beginning a competent lay inspector should be detailed to look after the supplies. His duties should consist in receiving and issuing supplies, keeping records of all supplies received, issued, ordered, or exchanged, and to see that additional supplies are ordered in time, so that they will be received before the supplies on hand are exhausted.

Government property, including tools, guns, suit cases, and rubber goods, should be stenciled "U. S. Department of Agriculture" in an appropriate place so that they may be identified.

Equipment for inspectors.—All veterinarians and others engaged in the examination of animals for symptoms of foot-and-mouth disease, or who have occasion to visit any premises upon which such animals have been kept, should be supplied with and make use of the following equipment:

1 suit case or other receptacle for carrying department property, disinfectants, etc. (preferably fiber).

1 rubber coat (special cloth coats may be substituted during extremely hot weather).

1 pair rubber boots.

1 pair rubber gloves.

1 rubber hat (washable cloth hats may be worn in extremely hot weather).

1 fiber washbasin, or, preferably, a fiber pail.

1 sponge.

1 bottle of bichloride of mercury tablets.

1 nose lead.

FARM-TO-FARM INSPECTION

Area to cover.—The inspector in charge of the district, with the aid of a map, should divide the territory into districts, keeping in mind the number of farms, the number of livestock, difficulty of travel, etc., and assign a veterinarian to each district under his supervision with instructions as to how frequently inspections should be made. Farm-to-farm inspection should cover areas of from 3 to 5 miles in radius from infected farms. This order, however, need not be followed literally when there are natural barriers or boundaries, such as rivers, mountains, or forests. On the other hand, when infection has occurred in several places along a frequently used public highway, it is advisable to proceed along this highway and inspect premises for probably 5 miles. As a general proposition, farm-to-farm inspection should extend to all premises situated in any community where there is reason to believe infection may exist. Where large range pastures are involved the inspection should extend considerably beyond a 5-mile radius, depending on intervening fenced inclosures, natural barriers, and other range conditions.

Procedure.—Inspectors on reaching premises where livestock is to be inspected should always put on their rubber outer garments before or immediately on

alighting from their conveyance, which should not be driven on to infected premises unless it is necessary to use an automobile in inspecting range cattle. In such instances the automobile should be disinfected just before leaving infected premises. During his first visit the inspector should inform the owner fully concerning the object of his visit, the location of infected premises, the nature of the disease, how it is spread, and advise concerning precautions to prevent the spread of the disease and to whom he should report any suspicious ailment noticed among his animals. Owners should also be encouraged to establish and enforce quarantine measures of their own to protect their herds.

On conclusion of the examination of the livestock, and just before leaving the premises, all employees must thoroughly sponge their rubber hats, boots, gloves, and coats, both on the outside and on those portions of the inside which may become contaminated, with a solution of bichloride of mercury of not less than 1 to 1,000 nor more than 1 to 750 strength. All foreign material should be washed from coats, boots, and gloves before the disinfectant is applied.

If on visiting premises infection is found, inspectors must exercise great care in disinfecting their outer garments before leaving. In addition to applying the disinfectant with a sponge, their boots, gloves, also the cuffs and tails of their coats, should be dipped in the disinfectant. If the weather is warm the entire coat may be submerged and agitated until all surfaces are wet.

Before leaving premises after inspecting livestock, even though no infection is found, cloth coats and hats, when used instead of rubber, should be dipped in the disinfectant until thoroughly saturated.

A fresh solution of disinfectant should be prepared each time inspectors are required to disinfect their outer garments.

The greatest care must be exercised to prevent carrying infection from diseased to healthy herds and to avoid criticism on account of apparent carelessness.

Number of inspections.—Daily inspections, for a period of at least 10 days, should be made of all livestock in the neighborhood of infected premises. The first inspection should commence as soon as possible after an affected herd is discovered and should include all susceptible animals within a radius of at least 2 or 3 miles of the infected premises. The inspection of premises outside of the specified area should extend at least 5 miles from the known infected area and should be repeated at least every 7 to 10 days until the disease is under control.

Record of inspections.—Each inspector should keep a record of all inspections made in a field book provided for the purpose. This record should show the name of the person or firm furnishing the conveyance, the price, the name of each owner of animals inspected, number of animals of each species inspected, and the condition of the animals when inspected. The veterinary inspector detailed to make the second or subsequent inspection should have with him the record of the previous inspections to guide him.

Reports to headquarters.—At the end of each day's work the inspector in charge of each substation should be required to make a report to headquarters by telephone, telegraph, or otherwise, showing:

1. Number of new infected herds discovered.
2. Number of infected herds slaughtered.
3. Number of infected herds awaiting slaughter.
4. Number of infected herds appraised.

5. Number of infected herds awaiting appraisal.
6. Number of trenches ready.
7. Number of trenches being dug. —
8. Number of premises disinfected.
9. Number of premises where herds have been slaughtered and the premises are ready for disinfection.

When this knowledge has been collected for an entire district, the inspector in charge should forward these facts in a night letter (telegram) to the Washington officials for their information.

DISPOSAL OF INFECTED HERDS

Confirmation of diagnosis.—As soon as foot-and-mouth disease is reported by a veterinary inspector, the diagnosis should be confirmed by at least one other veterinarian who has had considerable experience with the disease. After the diagnosis has been confirmed, arrangements should be made for the disposal of the animals (digging a trench, etc.), and while these arrangements are being completed the animals should be appraised.

Appraisal of animals.—Appraisals are usually made by two appraisers working together, one a representative of the State and one a representative of the United States Department of Agriculture. Care should be exercised in selecting appraisers in order to see that only men of proper temperament, good judgment, who are familiar with the various classes of livestock, are chosen for this duty. Appraisements must be made in accordance with State and Federal regulations.

The appraisers' records should show whether the animals were appraised at a dairy, meat, or breeding

value. A description (bull, steer, cow, heifer, calf, hog, sheep, and approximate age) of the animals and their appraised value should be a matter of record and one copy of this record should be given to the owner when the appraisal is finished. Owners should be invited to be present or have a competent representative present to confer with appraisers in placing values on animals. Owners should not be permitted to write any protest or reservation on the agreement form signed by them.

Where several owners have cattle on the same premises, that farm or ranch should be considered as a unit. However, each owner's cattle will be appraised in his name and considered a separate herd. It should be explained to the owner or his representative at the time the appraisal is made how indemnity claims are handled. The correct names and the addresses of owners to whom checks are to be mailed must be obtained. A full report regarding outstanding mortgages and liens should be submitted by the appraisers with each appraisal.

Photographers and visitors.—No photographers or other visitors should be allowed on infected premises or to witness the slaughtering and burial operation unless they have obtained in advance permission from headquarters.

Trenches for burying animals.—Where animals are to be disposed of by slaughter and burial, the digging of the trench should be started as soon as possible after the diagnosis has been confirmed. The owner of the affected herd should be induced, if possible, to take the contract for digging the trench, but if he refuses or is not equipped so to do, a contractor should be hired to do the work. A lay inspector should be detailed to supervise the digging and

should be instructed to remain on the premises until the work is finished. The contract price for the trench should be based on an agreed price of so much per cubic yard, with further agreement that the trench be completed as quickly as possible. In digging small trenches the work usually can be done more quickly and cheaply with picks and shovels. Contractors who undertake to dig large trenches should be properly equipped with teams, plows, scrapers, etc. On account of the greater cost, steam shovels should not be used where teams, scrapers, and plows or hand shovels can be advantageously used.

Contracts should be made in writing, stating the amount of dirt to be moved, additional cost where blasting is found necessary, whether the price is to include filling the trench, and all other essential details. Contracts for digging trenches should be signed by both the contractor and the agent for the department.

Trenches should be about 7 feet deep and not less than 7 feet wide. The length may be calculated by allowing 14 square feet of floor space for adult cattle weighing from 1,000 to 1,200 pounds each and varying the space proportionately when the animals are smaller. Usually there is room in such a trench for the additional number of hogs and sheep found on the average farm, allowing 4 mature hogs or sheep for each cow weighing approximately 1,000 pounds. If the number of hogs and sheep exceeds this proportion, additional space should be provided, calculating 14 square feet of floor space for 6 to 8 hogs weighing 200 pounds each, or 8 to 10 sheep.

If the sides and one end of the trench are made perpendicular, with the remaining end sloping, the

animals may be generally driven into the trench and confined there by building a fence across the open end. In this position they can be slaughtered with little labor. Occasionally, when the herd is small, it may be found advisable to construct a temporary pen at the side of the trench. The animals are driven into the pen, shot, and their bodies rolled into the trench after being dragged to the side of the trench. Usually trenches should be dug at convenient points, near the affected animals, in order that they need not be driven over uninfected territory, but in certain localities, as, for instance, infected ranges, it will be found expedient to concentrate animals at a central point for slaughter and burial.

Bills for digging trenches should specify the dimensions of the trench, the number of cubic yards of material moved, the price per yard, and indicate whether the price includes filling the trench. Bills should be submitted in duplicate and bear the O. K. of the inspector under whose supervision the work was done.

Slaughtering the animals.—One trained lay inspector should be placed in charge of each slaughtering crew with one or more lay inspectors as assistants. One man in charge and two assistants are usually sufficient to constitute a slaughtering crew, and in case of small herds two men only are necessary. Veterinarians should not be detailed to slaughtering crews, as their services are more important in their professional capacity.

Handling and slaughtering of all condemned animals should be done in the most humane manner possible. The animals should be killed by shooting. Only competent marksmen (not more than two or three in large herds) designated by the lay inspector

in charge of the killing, should do the shooting. A rifle of sufficiently large caliber to kill instantly should be selected. A 25-20 rifle or a similar gun is recommended. Aim should be taken with a view to piercing the brain.

Slashing hides and evisceration of carcasses.—The eviscerating, slashing of the hides, and other details should be performed by competent laborers.

After the animals are dead the thoracic cavities and the paunches should be opened freely and the hides slashed in various places to render them valueless for commercial use. After opening and slashing, the carcasses should be covered with unslaked lime. The amount of lime used may vary with local conditions, the ability to procure the lime, accessibility of the trench, etc. One barrel of lime for every 8 to 10 cattle or 15 to 18 sheep or swine is usually sufficient. If the animals are large, more lime should be used.

Filling trench, disinfecting implements, etc.—The trench should be filled with earth without delay according to instructions under heading "Trenches for burying animals" and a representative of the State or the department should remain on the premises to supervise the work. The clothing of the men and all implements and articles used, including plows, scrapers, trucks, wooden mats, horses' feet and legs, also their bodies if soiled, shall be disinfected under supervision before they are removed from the premises. The outer garments provided for the men employed in the work should be soaked in a 3 per cent solution of formalin or boiled before they are sent to the laundry. If rubber boots can not be provided, the shoes of the workers should be

thoroughly cleaned and washed with a disinfectant before leaving the premises.

Disposal under extraordinary conditions.—In some localities burial of animals in trenches may offer unusual difficulties, such as the presence of water too near the surface, extensive outcroppings of rocks, or other natural difficulties. Under such conditions the preparation of trenches may involve long delays or prohibitive expense. One means of meeting difficulties of these kinds is the cremation of the carcasses, using oil, preferably, for fuel. To facilitate burning, the carcasses should be elevated from the ground, as on a network of heavy iron rods resting on stones. Since burning gives rise to offensive odors, this method should be avoided, if possible, in closely settled communities.

Where gullies or abandoned railroad cuts are available they may be utilized after making them conform to the general dimensions of trenches. In hilly regions where the ground is entirely too rocky for excavating, dynamite may be used for blasting the sides of ravines so the débris may fall over the carcasses of the animals which have previously been driven into the ravines and shot. The usual depth of burial must be observed. These methods are for emergency use only, when the customary method of digging trenches is not feasible, and such departures from the standard method of burying animals in dug trenches should be followed only with the approval of the supervising inspector.

CLEANING AND DISINFECTION OF PREMISES

Disinfecting crew.—A veterinarian will be in charge, in each State, of the cleaning and disinfecting operations. A disinfecting crew consisting of a lay inspec-

tor and from 7 to 12 laborers has been found most satisfactory, efficient, and economical. The lay inspector should be competent to take charge of the crew during the absence of the veterinary inspector in charge.

After the animals are slaughtered and buried the infected premises should be cleaned and disinfected without delay. An accurate record should be kept by the lay inspector, showing the names of the men hired for work on the crew, number of hours each man worked, giving dates, the rate of pay per hour, and the total amount of compensation due. The time book should be sent to the district office at stated periods in order that pay rolls may be properly prepared.

Equipment of crew.—The inspector in charge of the disinfecting crew, his assistant, and two nozzle-men should be supplied with complete rubber outfits, each consisting of coat, boots, hat, and gloves. Overalls and jumpers should be provided for the remainder of the men. These outer garments should be removed at the end of each day's work and left on the premises, and before moving to another farm or premises should be thoroughly disinfected. In order to hasten the work of cleaning and disinfecting infected premises, the inspector in charge of the disinfecting work should precede his crew with a view of planning the work in advance and inducing the owners to haul out the manure and clean the barns and outbuildings preparatory to disinfection.

Standard equipment for a disinfecting crew consisting of 12 men should consist of the following:

5 manure forks (5-tine).	1 pair pliers.
3 scrapers (long handle).	2 milk cans (10-gallon).
3 ship scrapers.	1 pail (galvanized, 12-quart).
3 flat shovels (long handle).	1 force pump.
2 scoop shovels.	100 feet $\frac{3}{4}$ - inch pressure hose.
3 hoes.	1 spray gun.
3 garden rakes.	4 rubber coats.
3 heavy brooms.	6 pairs rubber gloves.
1 fiber push broom.	24 suits (overalls and jumpers).
1 ax.	
1 crowbar.	
1 pick.	
1 hatchet.	

In order to facilitate the transportation of the pumps and equipment, it is advisable to have made for each outfit a wooden chest fitted with lock and key. This chest should be made like a carpenter's tool chest. The equipment should be marked as specified under "Care of supplies" (page 9).

Destruction of property.—Upon arrival at infected premises the inspector in charge of the disinfecting crew should make an inspection to ascertain whether it is necessary to destroy any property in order to get rid of the infection. Only such property should be destroyed as is necessary to rid the premises of infection.

Record of property destroyed.—An accurate record should be kept of all property destroyed in disposing of herds and cleaning and disinfecting premises, giving the measurements, kind, and quality. The owner or his representative should be requested to be present when the measurements are taken or other records made of property destroyed, and before leaving the premises the inspector and owner should jointly sign this report. Such statements, or the book in which

such records are kept, should be forwarded as promptly as practicable to the office of the inspector in charge of the district in order that vouchers may be prepared and sent to the owner. The following form of statement is suggested:

Owner -----
 Township -----
 County ----- State -----
 P. O. address -----
 350 feet 2-inch pine plank (old and worn) ;
 500 pounds timothy hay ;
 600 pounds straw ;
 20 grain bags (fair) ;
 etc.
 (Signed) -----
 Inspector.

 Owner.
 Date -----

Records should be complete in order to avoid the necessity of sending another representative to the premises later to appraise the property destroyed. In order that there may be uniformity in adjusting claims of this kind, the inspector in charge of the disinfecting crew should adjust the claims and make the agreement with the various owners as to prices.

Payment for property destroyed.—In settling for property destroyed the inspector in charge of a station should inform himself regarding the price of hay, straw, lumber, etc., in the locality where such property was destroyed, and in settling claims allow prices accordingly, making fair allowance for waste in replacing lumber and for hardware, etc.

Cleaning and scrubbing buildings, etc.—All manure, loose litter, and trash should be removed from the

interior of buildings and burned. Barns and other buildings should be swept down thoroughly and all overhead beams or other projections should be thoroughly cleaned. In case there are stalls, mangers, feed boxes, wooden floors, etc., which are decayed or in such condition that they can not be thoroughly disinfected, they may be torn out and burned after being measured as heretofore described (pages 20, 21). Before destroying such property the condition of the lumber, the time of exposure, and the opportunity for infection should be taken into consideration, and it should be carefully borne in mind that if the virus of foot-and-mouth disease can be reached by disinfectants it can be killed with less expense than it will cost to tear out and replace.

Disinfection can be more successfully and easily accomplished when the buildings have first been thoroughly cleaned. Manure should be cleaned out of cracks, posts, stanchions, etc., and any contamination by saliva should be scraped and scrubbed. For this latter purpose a hot solution of sal soda is usually of assistance.

Application and selection of disinfectants.—A spray pump is the most satisfactory and effective means of applying disinfectants to large surfaces, such as walls, ceilings, manure piles, haystacks, straw stacks, etc.

Care should be exercised in selecting suitable disinfectants. A 3 per cent solution of formaldehyde is considered most suitable for hay, straw, chains, bells, halters, ropes, harness, blankets, feed bags, lap robes, and finished surfaces of walls, ceilings, etc.

Chloride of lime is very satisfactory for outside disinfection where there is plenty of air, as, for instance, manure piles, open sheds, stock pens, ground, etc., but the fumes are very irritating and deleterious

to those who attempt to spray with it in closed buildings. Interiors of buildings may be sprayed with saponified cresol solution, crystal carbolic-acid solution, or some of the other disinfectants prescribed by the regulations. When desirable, a small quantity of unslaked lime may be added to the solution in order to mark where the disinfectant has been applied.

Formaldehyde gas is suitable for disinfecting dwellings, cellars, milk houses, granaries, and other tight buildings. Clothing and other articles that can not be dipped or sprayed may be hung in such buildings and fumigated from 6 to 8 hours.

In fumigating buildings with formaldehyde gas, 20 ounces of formalin (40 per cent formaldehyde gas) to $16\frac{2}{3}$ ounces of potassium permanganate are required to disinfect 1,000 cubic feet of air space. A violent chemical reaction takes place immediately when the formalin and permanganate are brought together.

Ordinarily there is no danger of fire by this method. In exceptional cases, however, sparks may be given off from the mixture, so that it is desirable to place the container inside of a large open pot, and to have no combustible material in the immediate vicinity of the generator.

Methods of using this and other disinfectants are clearly explained in Farmers' Bulletin 926, "Some Common Disinfectants."

Infected hay and straw.—Where haymows, haystacks, and straw stacks have been infested by animals feeding from the sides or trampling upon them, the exposed sides and top should be thoroughly raked off or cut down for a distance of from $1\frac{1}{2}$ to 2 feet, and the remainder of the stock sprayed with a 4 per cent formaldehyde solution. The hay or straw re-

moved from the infected stacks should be measured and burned, a record being kept of the amount destroyed in order that adjustment may be made.

Disposal of manure.—After manure has been disinfected as described in these instructions, if weather and field conditions permit, it may be hauled out and spread upon a field to be plowed, where it is not accessible to swine or ruminants. If it is impossible to disinfect and spread the manure at the time, it should be hauled to some convenient spot, the surface forked over and mixed with chloride of lime to a depth of from 6 to 10 inches, and the top sprinkled with chloride of lime, or a layer of 6 inches of uncontaminated horse manure may be put on it. A strong, pig-proof fence should then be built about the pile. After the removal of this pile of manure the ground on which it lay should be limed and left exposed to the sun for a period of at least 30 days.

All litter and manure which have accumulated in the barn lots prior to the slaughter of the stock must be cleaned up, piled, and burned, thoroughly disinfected, or fenced away from livestock. All ground from which the litter or manure is cleaned up must be left exposed to the sun for a period of at least 30 days before permission is given to restock.

Disinfection of dogs, poultry, etc.—Immediately upon the quarantining of infected premises, all dogs, poultry, etc., should be confined until disinfection of the premises is completed. Before being released poultry, dogs, etc., should be dipped under the supervision of an inspector. Such animals may be dipped in a slightly warmed solution containing about 2 per cent of saponified cresol, or disinfected in such other manner as may be prescribed by the chief of the bureau.

Thoroughness essential.—Disinfection work should be completed as rapidly as possible, but it should be borne in mind that thoroughness is essential to the success of the work. Care should be taken that all shoes, clothing, implements, and equipment used by the owner or his help in the care of the infected herd are either destroyed or thoroughly disinfected before the disinfecting crew leaves the premises. If conditions are such that improvements can be suggested in the manner of disinfection herein prescribed such plans should be immediately reported to the inspector in charge of the work.

TESTING PREMISES AND RESTOCKING

Provided there is no active infection in the community, the testing of any premises may be commenced 30 days after the date the cleaning and disinfection was completed. The number of test animals should be determined according to the size of the area to be covered. Hogs and yearling calves are the most desirable for testing purposes. When placing test animals on premises care should be taken to eliminate feeds which might cause conditions or lesions that would complicate the diagnosis of foot-and-mouth disease. The inspection of the test animals should commence 48 hours after they are placed on the premises and be repeated every 48 hours for 10 days, after which semiweekly inspections should be continued to the end of the 30-day test period, when the owner may be allowed to restock gradually. Weekly inspections should be continued regularly during the 60 days following the 30-day test period. At the end of 90 days from the date the test was commenced, provided no disease has appeared, the premises may be released from quarantine. Condi-

tions might arise which would make it advisable to vary this procedure.

DISINFECTION OF CARS

Period of exposure.—All railroad cars, motor trucks, and other vehicles which have carried livestock in any quarantined area within a period of 30 days of the date of an outbreak of the disease, except those cars that have already been cleaned and disinfected since last used, must be cleaned and disinfected.

Method.—The rules for cleaning and disinfecting cars should be essentially those governing the disinfection of buildings. Both the exterior and interior surfaces and all corners and crevices should be cleaned. The interior surfaces, including car doors, should be washed with clean water applied by a hose, after which they should be sprayed liberally with a permitted disinfectant.

For disinfecting box and refrigerator cars to be used for carrying commodities such as fruit, vegetables, and dairy products which absorb odors, a 2 per cent solution of formalin should be used and the doors kept closed until an hour before loading.

A card, Form 57-A, filled in on both sides with a weatherproof pencil, should be attached to each side of each car cleaned and disinfected.

All manure or litter removed from infected or exposed cars and stockyards shall be burned, disinfected, or piled where it is not accessible to livestock. During winter weather any immovable frozen material on the floors of cars should be covered with air-slaked lime not less than 2 inches deep.

Records of cars cleaned.—All employees supervising the work of cleaning and disinfecting cars should

be instructed to take the numbers and initials of the cars cleaned and disinfected from the cars and not from the railroad records, and to make a careful check before reporting. When the car reported cleaned and disinfected is not a livestock car, the class of car to which it belongs should be clearly indicated, "box," "gondola," etc.

MISCELLANEOUS

Competition in the purchase of supplies.—Generally the emergency is so great that no delays to procure competition are expected. Where such competition may be had without danger or undue delay, as in a district where the work is organized and proceeding in a routine way, informal quotations may be obtained from several dealers (three, for instance), the lowest accepted, and the several quotations attached to the bill when sent to Washington for payment. Bids on trenching work may be handled similarly, when practicable.

Forwarding reports.—Inspectors in charge should forward promptly to the bureau at Washington all forms provided for the purpose of keeping records of animals infected, slaughtered, disinfection of premises, cars cleaned and disinfected, etc. Inspectors engaged in locating infected herds should include in their reports the manner in which infection was carried to the herds, and any other items of value. Reports should be filled out carefully and in a legible manner. In addition to these reports, daily telegraphic letters should be forwarded each night, as specified under "Reports to headquarters" (page 12), and such other information as may be of value or interest.

Resistance to inspectors.—Where inspectors are forbidden admittance to premises, or to make examination of animals in suspected territory, no physical force should be offered. Every effort should be made, however, courteously to convince the owner of the premises or stock of the necessity for making such examination. Failing to obtain admittance to the premises the inspector should notify the station inspector in charge, who shall immediately take the matter up with the State officials with a view to having the inspector accompanied by a local police official. Pending admittance to the premises or animals, the inspector should immediately call on the State authorities to place such premises or animals under close quarantine, under guard, until the examination can be made.

When inspectors are forcibly assaulted no resistance should be shown except that actuated by self-defense. Telegraphic notice should be at once forwarded, through the inspector in charge, to the chief of the bureau, who will advise of the legal action to be taken.

Shipments from quarantined areas.—When permission is obtained from the Secretary to move livestock from a quarantined area for immediate slaughter, arrangements should be made in advance to handle the animals through specially designated chutes and yards away from other susceptible animals and to have them slaughtered within a specified time.

In some instances where shipments of livestock originating in quarantined areas have been permitted for immediate slaughter only, such shipments have been diverted or sold at point of destination as stockers or feeders, and infection of new territory

has resulted. Efforts should be made to see that shipments of livestock so consigned are slaughtered with as little delay as possible, and the cooperation of the State authorities should be enlisted to this end.

Infection at establishments under Federal meat inspection.—Where animals are found infected in the pens of an establishment under Federal meat inspection the carcasses should be condemned under the meat-inspection regulations. The hides from such carcasses may be immersed for not less than four hours in a mixture composed of 1 part of bichloride of mercury to 1,000 parts of salt solution of a strength not less than 15 per cent to saturation, or treated in accordance with such other method as may be prescribed by the chief of the bureau. The outer clothing of all workers in the establishment, which might have become contaminated, and all implements and utensils, should be sterilized. The killing floors, knocking and bleeding pens, alleys, chutes, infected and exposed pens, coolers, and the cars, boats, automobiles, or other vehicles in which the animals were shipped should be thoroughly cleaned and disinfected.

Immediately the shipment should be traced back to the premises from which it came to ascertain whether other animals in the community or any that came in contact with them or passed through the same chutes, pens, or conveyances, are infected.

Violation of quarantine regulations.—Where infection is discovered following any violation of the quarantined regulations, no appraisement of animals so handled should be made by bureau inspectors

without special authorization from the chief of the bureau.

Method of dividing the payment of expenses.—Payments of indemnities for animals slaughtered and property destroyed are limited by law, the department being unable to pay more than one-half the appraised values. As nearly as possible such expenses as those enumerated below should be shared 50-50 by the State and the department:

Hire of men used in the slaughter and burial of animals; hire of men used in disinfecting infected premises; transporting slaughter crews and disinfecting crews; purchase of guns and ammunition; purchase of supplies, including hardware, disinfectants, rubber goods, jumpers, and lime; freight and cartage on supplies used in the work; trenching and refilling; rents or storage charges where disinfecting supplies are stored; and similar items as may be agreed upon.

Expenditures for salaries of regular department employees, their reimbursement for travel expenses, telephone and telegraph, and office supplies and forms used by the department forces are generally taken care of entirely by the department.

Reporting unexpended property at completion of work.—Upon completion of the work at the end of an outbreak, bureau employees should furnish the Washington office with an alphabetical list in duplicate of all the nonexpendable property in their possession, used especially in connection with foot-and-mouth disease, giving the condition of the various articles. As soon as pumps, guns, tools, hoes, picks, etc., are no longer needed for constant use they should be properly and thoroughly cleaned and all articles that are liable to rust should be coated with petrola-

tum or oiled or painted. Hoes, rakes, shovels, etc., should be bundled and securely wired together and preparations made for boxing or otherwise packing them for shipment in compliance with instructions.



